

## Statement of Work for the Mechanical Systems Harmonization Working Group (MSHWG)

### I. Task Assignment

#### IA. Objectives

The Mechanical Systems Harmonization Working Group (MSHWG) will develop and recommend appropriate changes to the FARs, JARs, and any associated advisory material, related to mechanical systems features in transport category airplanes, in accordance with the following Harmonization Task that the Aviation Rulemaking Advisory Committee (ARAC) has accepted from the FAA (reference FAA Notice FR July 26, 2001, pages 39074 to 39075):

The MSHWG will have a complete understanding of the Task Statement and will aim to achieve fully harmonized regulations and advisory materials with an objective of the text adopted by the FAA and JAA being identical to the greatest practical extent.

The MSHWG will also strive to establish common interpretations of the regulations and advisory material such that the work required by industry to achieve certification by one authority would be equally acceptable to all authorities.

The MSHWG will have an objective to produce material which supports acceptance of one State's operational approval by other States. The group will coordinate with other groups responsible for operational regulations to support this objective.

**The MSHWG will develop and recommend appropriate changes to both 25.831(g) and 25.841(a,2&3) that achieve an acceptable level of safety without precluding flight at cruise altitudes in higher, less congested airspace.**

#### IB. Tasking Statements

Part 1; Temperature and Humidity (25.831(g))

- A. Review the current airworthiness standards for transport category airplanes regarding airplane cabin and flight deck temperature and humidity environment.
- B. Determine if revisions are needed to ensure the ventilation system, following system failures, will provide a suitable temperature and humidity environment for crew and passengers. The assessment should consider:
  - 1. The types of airplane system failure conditions that should be addressed.
  - 2. Setting the appropriate limiting values of cabin and flight-deck temperature, humidity levels, and exposure times to eliminate any unacceptable impact on flight crews and cabin crew performance, disabling any passengers, or creating long-term health problems to passengers or crews.

3. Any relevant National Aeronautics and Space Administration (NASA), United States (US) Armed Forces, National Institute of Occupational Safety and Health (NIOSH), Occupational Safety and Health Administration (OSHA), Federal Aviation Administration (FAA), academia and industry standards for pressure, temperature and humidity.
- C. Develop a report based on the review, and recommend any revisions to the rules (including cost estimates) and advisory materials needed to address the above issues.
  - D. If as a result of the recommendations in this report, the FAA publishes a notice of proposed rulemaking and/or notice of availability of proposed advisory circular for public comment, ARAC may be further tasked to review all comments received and provide the FAA with a recommendation for disposition of those comments.

Part 2: Cabin Pressurization (25.841(a))

- A. Review the current airworthiness standards for transport category airplanes regarding airplane cabin altitudes resulting from cabin decompression.
- B. Determine if revisions are needed to ensure that during certain failure conditions the cabin environment is suitable for crew and passengers. The assessment should consider:
  1. The types of airplane system, structure, and/or propulsion failure conditions that should be addressed.
  2. The factors that impact the level of severity of the threat, airplane design features, and operation procedures that could be used to moderate the severity of the threat.
  3. The recommendation of appropriate cabin pressure standards that would govern cabin air quality following certain failure conditions. These standards should ensure that exposure time to a reduced oxygen partial pressure in the airplane does not reach a level that would:
    - a. Negatively impact the flight-deck crew's performance to the extent that the flight crew could not safely control the airplane during an emergency descent,
    - b. Disable any cabin crew member or passenger to the degree that resuscitation techniques would be needed to revive, or
    - c. Create long term health problems for the crew or passengers.
  4. Any relevant NASA, US Armed Forces, NIOSH, OSHA, FAA, Academia and industry standards.
- C. Develop a report based on the review, and recommend any revisions to the rules (including cost estimates) and advisory materials needed to address the above issues. It is required that

the recommendations be substantiated with corroborating material and that all dissenting positions be reported and thoroughly documented.

- D. If as a result of the recommendations the FAA publishes a notice of proposed rulemaking and/or notice of availability of proposed advisory circular, ARAC may be further tasked to review all comments received and provide the FAA with recommendation for disposition of those comments.

## **II. Issues**

### **IIA. Identification and Tracking of Issues**

The MSHWG will identify all issues associated with this task. It will be the responsibility of the working group co-chairs to document each issue, collect positions from the MSHWG members, identify actions, track developments, and document resolution.

### **IIB. Identification of Issues Affecting Other HWGs and Issues Groups**

The MSHWG will coordinate with other harmonization working groups, organizations, and specialists as appropriate. Other affected groups, organizations, and specialists may include but not be limited to the Powerplant Installation Harmonization Working Group, Engine Harmonization Working Group General Structures Harmonization Working Group (GSHWG), Loads & Dynamics Harmonization Working Group (LDHWG), Flight Test Harmonization Working Group (FTHWG), Flight Controls Harmonization Working Group (FCHWG), Emergency Evacuation Issues Group (EEIG), Human Factors Harmonization Working Group (HFHWG), United States Armed Forces, National Aeronautics and Space Administration (NASA), National Institute of Occupational Safety and Health (NIOSH), Occupational Safety and Health Administrations (OSHA) and various academia experts.

## **IV. Assignment of Tasks**

In the process of addressing issues, the MSHWG may form a Task Group to handle a specific issue. The Task Group must provide reports to the working group. A Task Group is disbanded when all of its assignments are completed.

The MSHWG may request ARAC assignment of tasks to existing working groups if necessary. The MSHWG will identify to ARAC the need for additional new working groups when existing groups do not have the appropriate expertise to address certain tasks.

## **V. Work Methods**

The Mechanical Systems Harmonization Working Group will comply with the procedures adopted by ARAC (Operating Procedures For The Aviation Rulemaking Advisory Committee, October 1997 Revision). As part of the procedures, the working group is expected to:

1. Recommend a Work Plan for completion of the tasks, including the rationale supporting such a plan, for consideration at the next meeting of ARAC to consider Transport Airplane and Engine Issues held following tasking (FAA Notice FR July 26, 2001, pages 39074 to 39075).

2. Give a detailed conceptual presentation of the proposed recommendations, prior to proceeding with the work stated in item 3 below.
3. Draft the appropriate documents and required analyses and/or any other related materials or documents.
4. Provide a status report at each meeting of ARAC held to consider Transport Airplane and Engine Issues.

The following items describe the MSHWG work methods:

1. The MSHWG will be co-chaired by European and United States Industry members (Hartwig Asshauer, representing Airbus and European Association of Aerospace Industries, and Kenneth (Pat) Waters representing The Boeing Company and AIA).
2. The role of Secretary for the MSHWG will be a rotational assignment between the members.
3. FAA and JAA will each provide a designated representative to the MSHWG (Stephen Happenny - FAA Transport Airplane Directorate and Eric Duvivier - JAA)
4. The MSHWG meetings shall alternate between Europe and the United States to the greatest practical extent and, between meetings, progress using electronic media as much as practical.
5. The Co-chairmen will rely on the industry organizations and regulatory agencies to provide appropriate specialists to support the harmonization process and to conduct the dissemination of information within their organizations (e.g. Working Group Report, Draft Rule revisions, Draft Advisory Material, etc.). The organizations should also assume the responsibility for ensuring the development of their member's position and providing that information to the designated person for inclusion in the Working Group Report.
6. Individuals can request membership of the MSHWG by written request to one of the Co-chairmen accompanied by a statement of their experience and interest in the Mechanical Systems Harmonization activity. Members will not be added or substituted without the approval of the assistant chair, the assistant executive director, and the working group co-chairs.
7. The MSHWG shall function as a Working Group under the ARAC Charter, and will report to the Transport Airplane and Engine Issues Group (TAEIG).
8. The United States Co-chairman shall make periodic progress reports to the TAEIG.
9. The FAA Designated Representative shall assist the United States Co-chairman in preparing material in a form for submittal to ARAC for transmittal to the FAA for NPRM action.
10. The JAA designated member shall be responsible for coordination with relevant JAA Study Groups, Steering Groups and Committees, and for progressing NPA material with the JAA Secretariat.
11. Meetings of the MSHWG will not be open to the public, except to the extent that individuals with an interest and expertise are selected to participate. There will be no public announcements of working group meetings.

## VI. Membership

The MSHWG shall be made up of members who have an interest and expertise in human response to rapid decompression, low oxygen partial pressure, temperature extremes and humidity extremes as well as other areas of expertise as deemed necessary by the group. Because of the wide range of issues and disciplines, it is the objective of the Co-chairmen to work through established industry and government organizations to the greatest extent possible. The principal affiliations and the nominated representatives are identified below.

The members of the MSHWG will be drawn primarily from individuals representing the Regulatory Authorities, government agencies and various Industry Associations. The MSHWG will be supplemented with additional technical experts as necessary. Individuals may request membership by contacting the Co-chairmen and indicating their qualification and rationale for participation.

*Topic list*

AFFILIATIONS	VOTING MEMBERS
FAA	Stephen Happenny
JAA	Eric Duvivier (prime) & Mark Shortman (second)
Airbus & European Association of Aerospace Industries	Hartwig Asshauer, European Co-Chair (prime) & Stefan Repp (second)
Boeing & AIA	Pat Waters, U.S. Co-Chair (prime) & Mark Lord (second)
Cessna	Roy Shelinbarger
Honeywell	Stan Pollit
Gulfstream	Mehdi Motlagh
Fairchild/Donier	Ms. Anna Katysheva
Embraer	Pedro Seiti Endo (prime) & Eduardo Borges (second)
Bombardier	Keith Ayre
British Airlines & Association of European Airlines	Dr. Michael Bagshaw
ATA	Charlie Bautz
CAMI	Dr. Noel May
academia	Dr. Ivo Martinac (Univ. of Sweden, Dr. Stanley Mohler (Wright State University)
ALPA	Captain Bernie Sanders
NASA	Dr. Michael Powell
U.S. Air Force	Lt. Co. Thomas Morgan
Transport Canada	Jim Marko

*at least 2 members have applied for membership*

## **VII. Schedule**

The Federal Register tasking requires that the Working Group Report be submitted no later than 24 months after the task is published by the FAA in the Federal Register. That date would be July 26, 2003. However, the Co-Chairs of the MSHWG believe that the Working Group Report can be produced and submitted using the more optimistic schedule below.

### **Meeting schedule**

<b>MSHWG MEETINGS</b>	<b>Tasks</b>	<b>Dates</b>
#1 – Seattle	Stat. of Work	4 <sup>th</sup> qtr, 2001
#2 - Paris	Concept	1 <sup>st</sup> qtr, 2002
#3 – East Coast	Tech Agreement	2 <sup>nd</sup> qtr, 2002
#4 - Seattle	WGReport	3 <sup>rd</sup> qtr, 2002
#5 - Europe	TBD	4 <sup>th</sup> qtr, 2002

*Supplemental / preliminary schedule*

### **Schedule - General**

<b>Activity</b>	<b>Date(s)</b>
MSHWG Tasked	July 26, 2001
European Co-chair Approved	Aug. 15, 2001
Identify Working Group Members	Aug. 24, 2001
Work Plan to TAEIG	Sept. 12, 2001
TAEIG Approve Work Plan	Sept. 12, 2001
MSHWG Technical Agreement	April, 2002
Final Draft, WGReport	Aug., 2002
Final Draft to TAEIG	Sept., 2002
TAEIG Approval	Sept, 2002